



# Supplemental Material to Constructing Hierarchical Continuity in Hilbert & Moore Treemaps

Willy Scheibel  and Jürgen Döllner 

University of Potsdam, Digital Engineering Faculty, Hasso Plattner Institute, Germany

## Figures















This supplemental material provides details on the Hilbert and Moore treemap layout process (Figure 1) and the available set of templates during subdivision (Figure 2). Further, the examples are extended by a full gallery of layouts for the popular names of The Netherlands dataset (Figure 3) as well as detailed examples of the software repository dataset (Figure 4 and Figure 5).

## Prototype

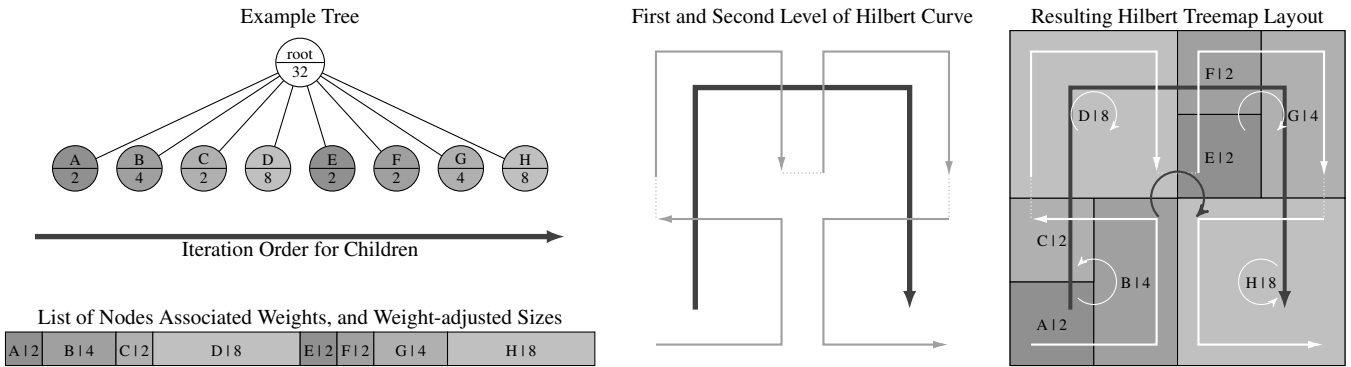
The prototype is published as an Open Source repository on Github<sup>1</sup>. The prototype can be used to reproduce the layouts and the debug view of the space-filling curve. The used datasets are integrated as well. Please refer to the `README.md` of the repository for more information on how to setup, compile, and use the prototype. By adhering to the CSV file format, a researcher or practitioner can also test out own datasets.

## Used Software Repository Datasets

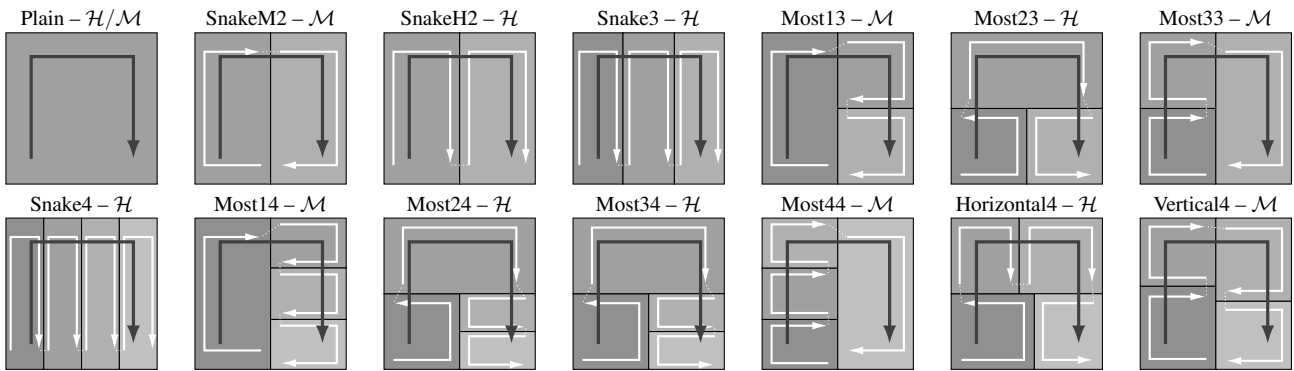
Following is the list of used datasets and basic statistics. If a dataset spans multiple snapshots, the number of nodes and the max depth are derived from the last snapshot. The used weight metric for layouting is *Lines of Code* (LoC).

Name	Location	Weight	# Nodes	# Leaf Nodes	Max Depth
Calculator	 microsoft/calculator	LoC	371	334	6
CPP Rest SDK	 microsoft/cpprestsdk	LoC	579	446	9
glbinding	 cginternals/glbinding	LoC	740	639	9
glfw	 glfw/glfw	LoC	117	105	4
globjects	 cginternals/globjects	LoC	454	407	9
GSL	 microsoft/GSL	LoC	21	18	3
Open Source Portal	 microsoft/opensource-portal	LoC	413	334	6
STL	 microsoft/STL	LoC	1 368	800	7
TensorFlow.js	 tensorflow/tfjs	LoC	2 060	1 894	12
The Algorithms C++	 TheAlgorithms/C-Plus-Plus	LoC	239	218	4
VFS For Git	 microsoft/VFSForGit	LoC	943	790	7
webgl-operate	 cginternals/webgl-operate	LoC	202	183	4
Kubernetes	 kubernetes/kubernetes	LoC	16 963	13 175	16
Firefox	 mozilla/gecko-dev	LoC	114 364	105 579	16

<sup>1</sup> Repository is hosted at [varg-dev/hilbert-moore-treemap-layouts-prototype](https://github.com/varg-dev/hilbert-moore-treemap-layouts-prototype).

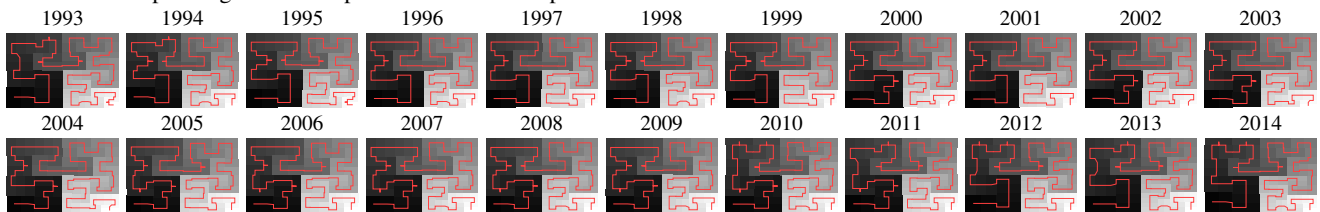


**Figure 1:** A layout example for a tree with the node list A–H with associated weights and a summed weight of 32 (left). This list of nodes is arranged out on a Hilbert curve (middle). The line path indicate the path and direction of the layouting process for the base level (dark) and the quadrant levels (light). Applying templates and derive the final rectangles results in the treemap layout (right). The resulting layout subdivides the rectangle assigned to the root, whereby the area of a child is proportional to the the overall sum of the root node. The arcs with arrows indicate the base orientation of the respective layout elements. The joint paths of one level approximate a space-filling curve.

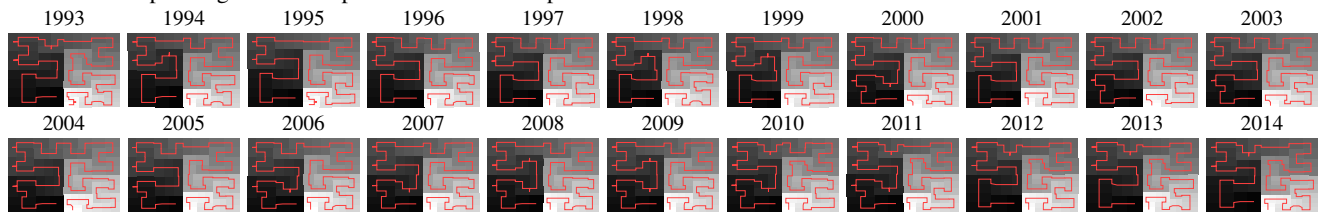


**Figure 2:** Layout templates for recursive subdivision of 1, 2, 3, and 4 nodes. The line indicate the path and direction of the layouting process for the base level (dark) and the quadrant levels (light). The joint paths of one level approximate the respective space-filling curve ( $\mathcal{H}$  – Hilbert curve,  $\mathcal{M}$  – Moore curve).

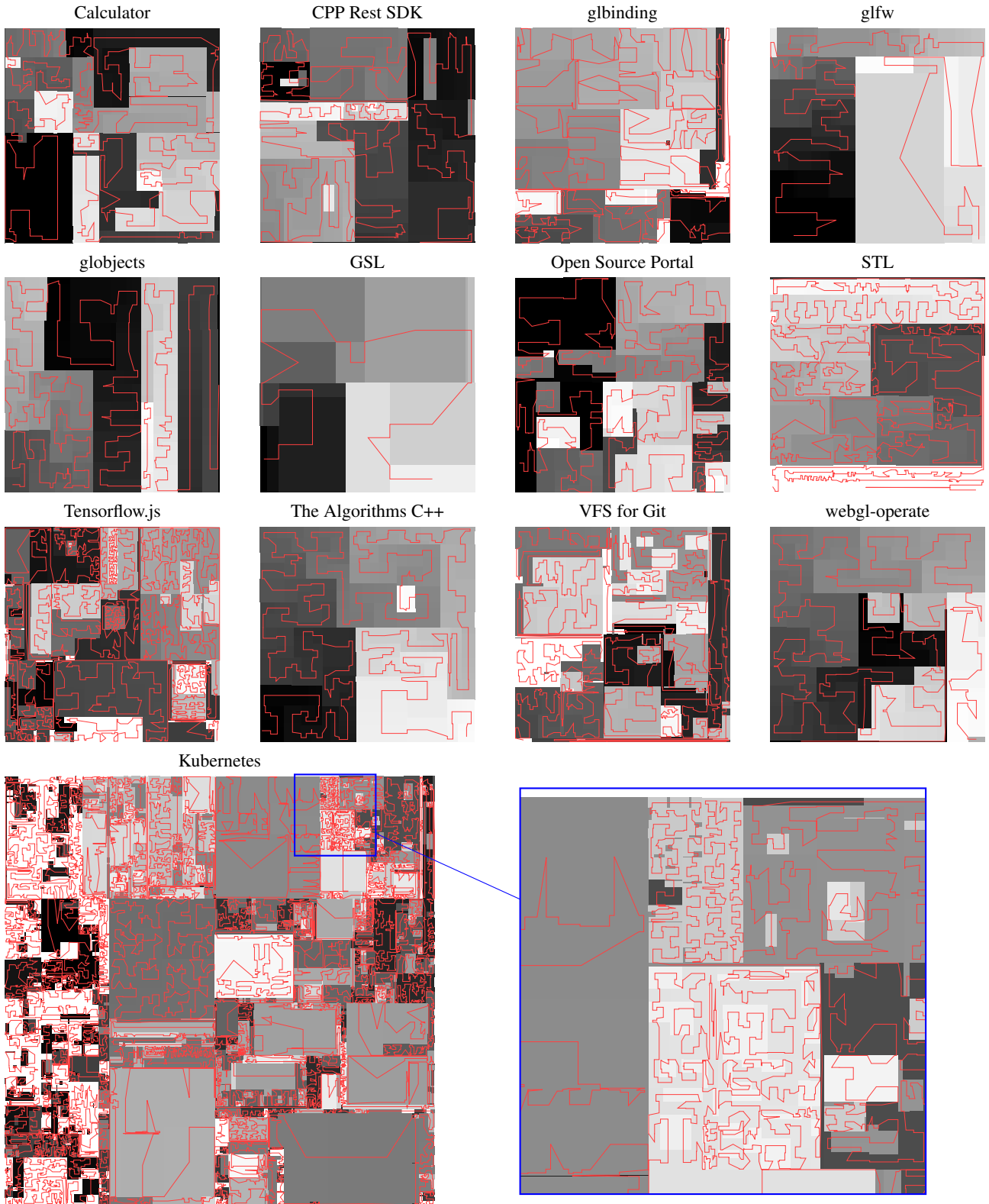
Hilbert Treemaps using Variance Optimization on the Popular Names Dataset



Moore Treemaps using Variance Optimization on the Popular Names Dataset

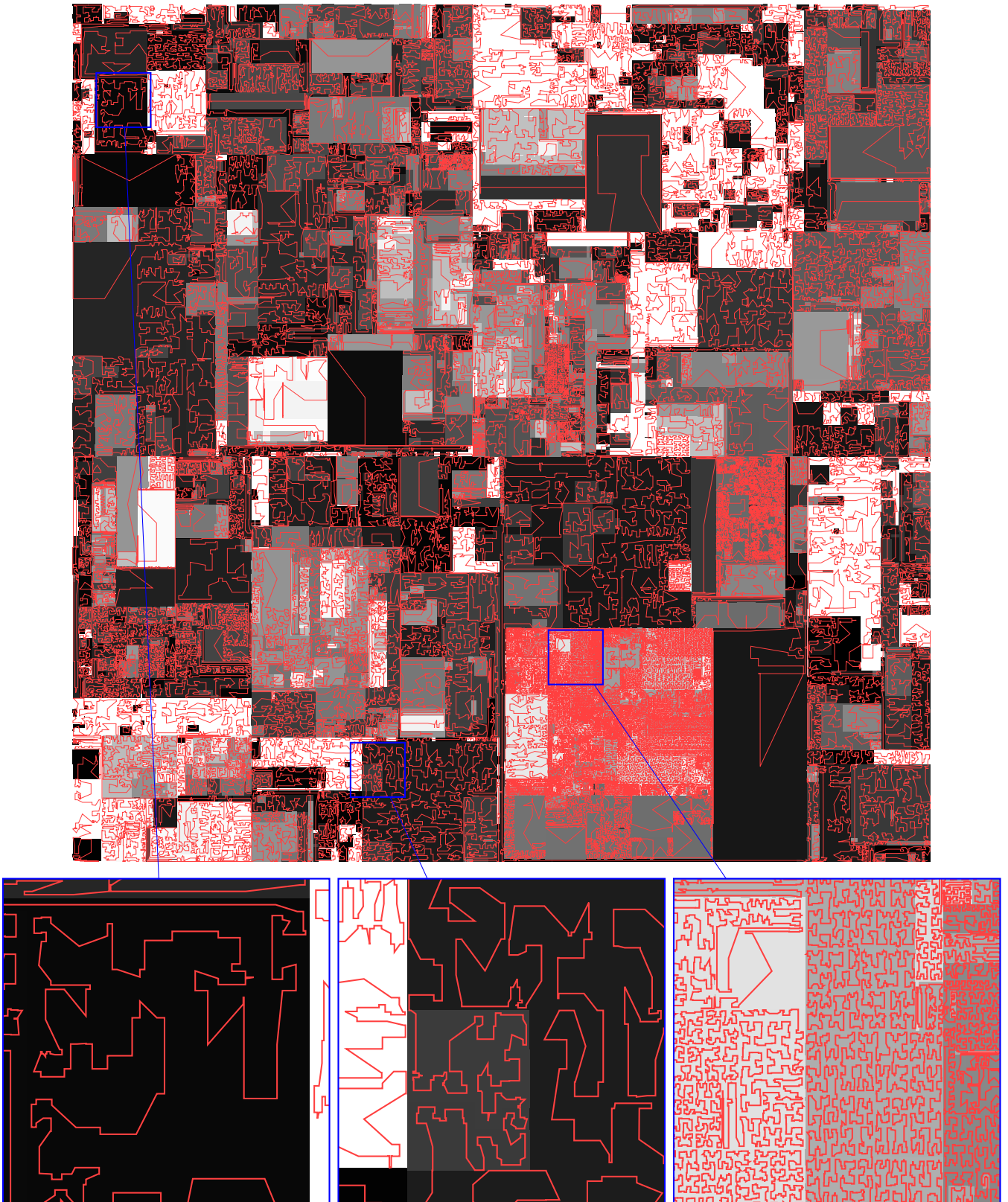


**Figure 3:** Hilbert and Moore treemap layouts on the popular names dataset of The Netherlands between 1993–2014 and highlighted space-filling curve.



**Figure 4:** Layout examples and highlighted space-filling curves for selected software repository datasets – excluding Firefox – using the min-variance weight partitioning with the Hilbert space-filling curve. The color mapping is the node index in the dataset – not the position in the tree – to a grayscale color gradient.

Firefox



**Figure 5:** Layout example for the Firefox dataset using the min-variance weight partitioning with the Hilbert space-filling curve. The color mapping is the node index in the dataset – not the position in the tree – to a grayscale color gradient.